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INSULATION

FOR COLD, HEAT, SOUND, MECHANICAL VIBRATION, CONDENSATION, ETC.

UNION FIBRE Co.

INCORPORATED

Engineers and Manufacturers

BULLETIN No. 1L

WINONA, MINNESOTA, U. S. A.

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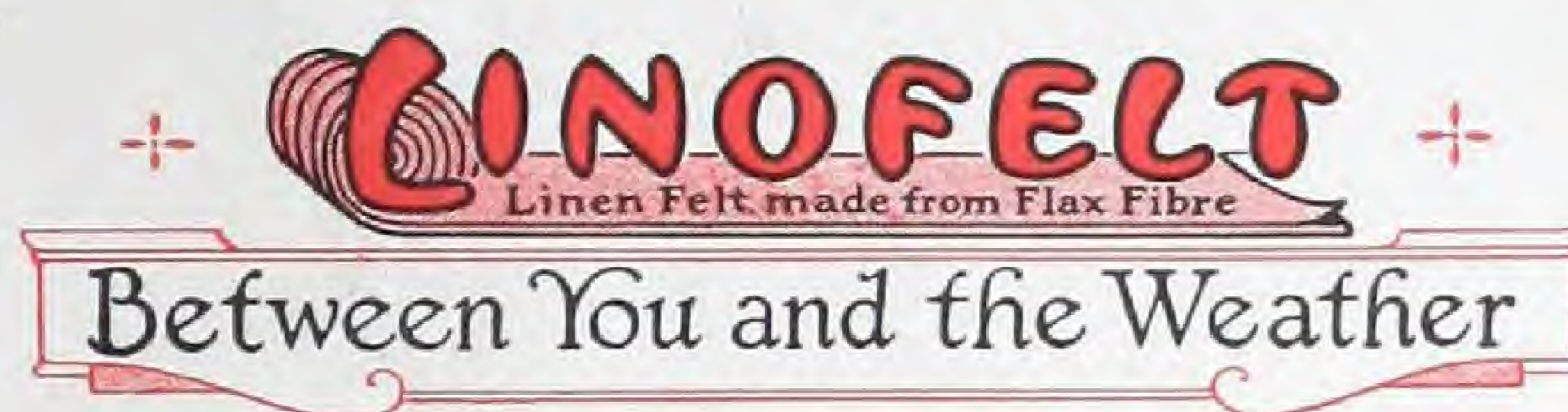


Fig. 1

Residence in course of construction, showing application of LINOFEEL directly on sheathing boards in place of ordinary building paper.



LINOFEEL is an insulating quilt made by sewing different thicknesses of a uniform bat of retted flax fibre between two layers of paper. It is used to prevent the passage of heat, and to deaden and absorb sound waves.

It is not a new product, but has been found absolutely satisfactory in building construction for twenty years. This material was originally known as "Kelly's **LINOFEEL**", and is still specified by many architects under that name.

REASONS FOR INSULATING

Comfort

The proper insulation of the walls and roof of a building will keep in the artificial heat in cold weather, and keep out the natural heat in hot weather, with resulting comfort in both cases. Rooms located directly beneath thin roofs can thus be rendered, not only habitable, but actually comfortable. With a complete insulation, drafts through the walls are absolutely eliminated.

Reduces Initial Cost of Heating Plant

The heat losses through various types of walls and roofs is easily calculated, and such losses are always considered in designing the heating system. It is obvious that the lower the losses, the smaller, and cheaper, the heating plant required.

Saves Fuel

It is also evident that the less the heat losses through walls and roof, the less the fuel necessary for heating

the building. These savings are shown on the following pages, in an actual example.

Increases Value of Building

The considerations of comfort, fuel saving, etc., are now so well recognized that the fact that a building is properly insulated adds to its actual sale value.

Sound Deadening

If floors and partitions are insulated, the passage of noise from floor to floor, or from room to room, is entirely prevented, with resultant comfort to the occupants.

Cheap, or Temporary, Partitions

Wall boards, plaster boards, etc., can be used for partitions, or for the finishing of attics, etc. very satisfactorily if combined with the proper insulating material to prevent the transmission of heat and sound.

Portable Houses, Garages, Etc.

Portable houses, garages, etc., can be made comfortable, and easily heated in cold weather if insulated.

REASONS FOR USING LINOFEEL

A Complete Insulation

LINOFEEL is a **complete** insulation. This means that it has inherently all of the essentials of a perfect thermal insulation, which must not only be an exceedingly poor conductor of heat, but **must also be windproof**.

It is well known by those having much experience out of doors in cold weather, that it is not only necessary to confine the heat of the body by means of woolen clothing, but also to wear **outside** of this clothing a windproof garment such as a coat of canvas, leather, or similar material, impervious to wind.

This is equally true in insulating a building. The flax fibre bat of **LINOFEEL** is an ideal insulating material from the standpoint of heat conduction, and the paper on both sides is the best known wind break. With many forms of insulation it is necessary to use building paper in addition to the insulating material, in order to prevent the passage of air, and the cost of such paper should be included with the cost of such insulation in comparing it with **LINOFEEL**.

LINOFEEL gives the most insulation, per dollar expended, of any material procurable.

Better and Cheaper Than Back Plaster

As shown by the data given on the following page, **LINOFEEL** is not only cheaper, and easier applied, than back plaster, but is also more permanent, and more efficient. In all buildings in which back plaster is used a great accumulation of fallen plaster is always found at the bottom of walls and partitions, as it is impossible to

keep this plaster permanently in place on account of the expansion and contraction, due to changes in temperature.

Odorless

LINOFEEL is odorless, and will not develop odors under any conditions. Insulations made from seaweeds will develop a "fishy" odor in damp weather. The School House Commission of one of our large cities had a disastrous experience with such an insulation for this reason, and has since standardized on **LINOFEEL** for all future work. Insulation containing animal hair will also develop disagreeable odors, owing to the decomposition of the animal oils contained in the hair, when exposed to dampness. If such oils are entirely removed in the process of manufacture, the hair will crumble to dust.

Vermin Proof

Owing to the chemicals used in the preparation of the flax fibre, **LINOFEEL** is absolutely vermin proof at all times. Rats, mice, bugs, etc., cannot eat the fibre, and will not nest in it.

Proof Against Climatic Conditions

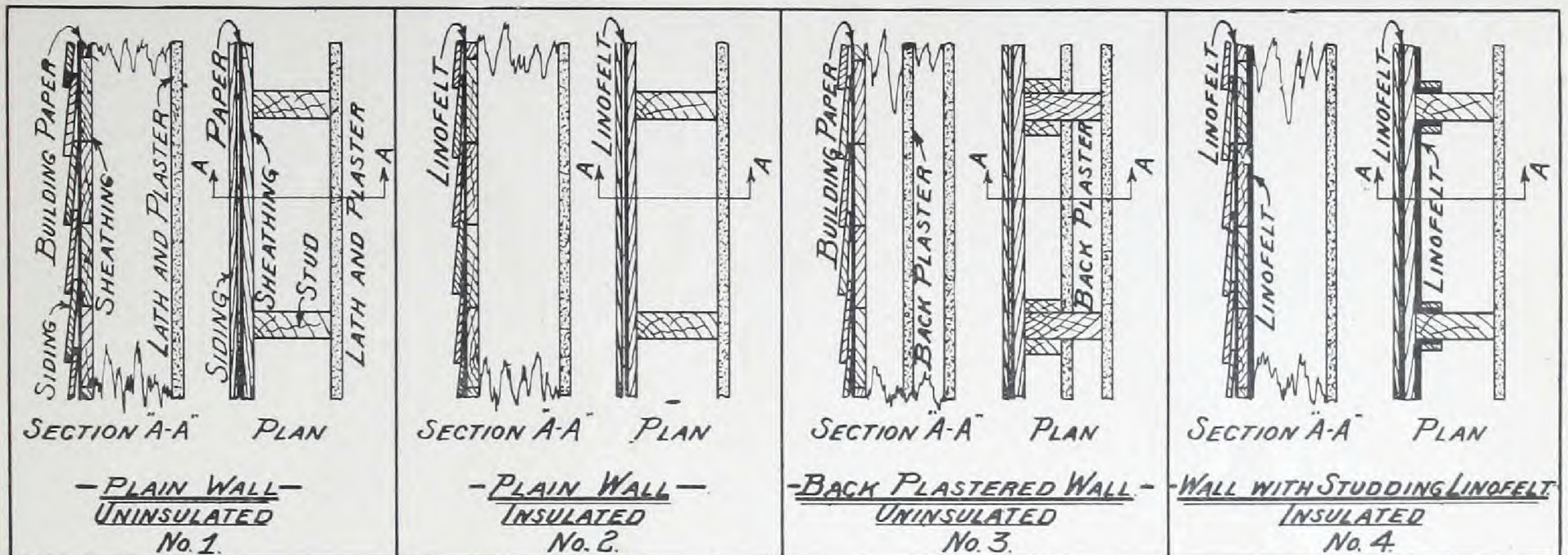
The flax fibre contained in **LINOFEEL** will not deteriorate under the action of either cold or boiling water, and it will not disintegrate when absolutely dry. Animal hair used in insulating materials will break down into a powder when it becomes thoroughly dried out.

LINOFEEL cannot rot.

LINOFEEL has been used continuously for years for insulating refrigerator cars and cold storage compartments.

HEAT LOSS THROUGH WALLS AND ROOF

UNINSULATED AND INSULATED WITH LINOFEEL



Wall No.	DESCRIPTION	Heat Loss in B. T. U.				Heat Saving					
		Uninsulated	Back Plastered	LinoFelt Insulated		Back Plastered		LinoFelt insulated			
				One Ply	Two Ply	B.T.U.	Per Cent	One Ply	Per Cent	Two Ply	Per Cent
1	Uninsulated Plain Wall	0.23									
2	Insulated Wall with LINOFEEL substituted for Building Paper between Siding and Sheathing			0.19	0.16			0.04	17.4	0.07	30.5
3	Back Plastered Wall (New — Before deterioration due to falling plaster)		0.20			0.03	13.1				
4	Insulated Wall with LINOFEEL only between studs in place of Back Plaster			0.13	0.11			0.10	43.5	0.12	52.2
4	Insulated Wall with LINOFEEL between Siding and Sheathing and also between Studs			0.12	0.10			0.11	47.9	0.13	56.5
	Roof—Shingles on 7/8" Boards	0.40		0.19	0.15			0.21	52.5	0.25	62.5

NOTE:—Per cent Heat Saving = $\frac{\text{Heat Saving with LINOFEEL}}{\text{Heat Loss—Uninsulated}}$

THE Heat Loss and Heat Saving are given in B. T. U. per sq. ft., per degree difference in temperature between inside and outside of wall, or roof, per hour.

For the benefit of non-technical readers, the B. T. U. or British Thermal Unit, is the amount of heat required to raise the temperature of one pound of water one degree, Fahrenheit.

The above sketches and table show the data regarding insulation as applied to the most common type of wall, namely, frame construction. The sketches show similar construction except for the insulation.

The Union Fibre Co., Incorporated, will gladly furnish similar data for any type of wall desired.

ANY person building a home is primarily interested in comfort in that home. The table on the preceding page emphasizes very forcibly how greatly **LINOFELT** adds to the comfort of a home, both in Winter and Summer. This is especially true of the roof of the house.

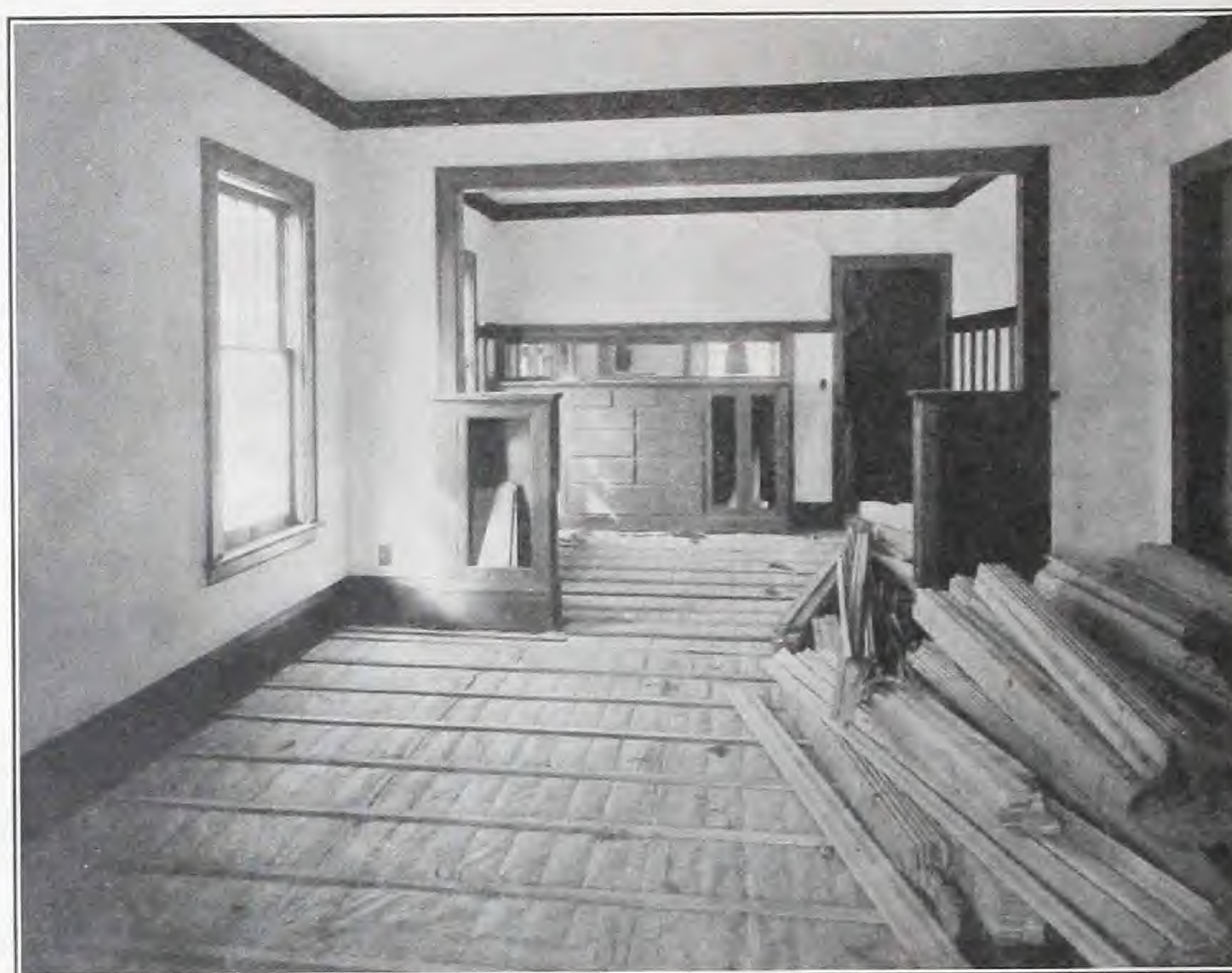
The roof is not only thinner than the walls, and therefore transmits more heat, as shown by the heat loss table, but in Summer it is exposed to greater heat than the walls. Ordinarily there is no shade on the roof, and neither is there paint to reflect the heat. The

sleeping quarters in a two-story house, will remain cool the entire day.

A cellar is cool in the Summer because the heat is excluded.

An uninsulated, two-story house may be cool on the first floor, when the second floor is exceedingly hot, and the attic unbearable. By insulating the walls and roof with **LINOFELT**, all rooms are equally cool and comfortable.

LINOFELT is carried in stock in one-ply, and two-ply thicknesses of 32" and 36" widths, and also of proper widths to permit placing between standard spaced



Showing **LINOFELT** applied between rough and finished floors for deadening sound, and preventing transmission of heat.

roof receives the perpendicular heat rays, with consequent greater intensity.

Everyone knows how uncomfortable are the rooms directly beneath a hot, uninsulated attic. If the roof is insulated with **LINOFELT**, and 62.5% of the heat is excluded, all of the rooms in a one-story house, or the

studs. It is made in greater thickness, and different widths on special order.

LINOFELT is covered with either strong Kraft paper, heavy waterproof paper, asbestos paper, muslin, or burlap. Various combinations of these coverings are also made.

DETAIL PLANS AND SPECIFICATIONS WILL BE FURNISHED ON REQUEST

PRODUCTS OF THE UNION FIBRE CO., INCORPORATED

LINOFELT
UNION PIPE COVERING
ACOUSTICAL FELTS AND BOARDS

FIBROFELT
UPHOLSTERY TOW
REFRIGERATOR DOORS

WATERPROOF LITH
MINERAL WOOL
INSULATION ACCESSORIES

Write for Bulletin No. 1R — "THE INSULATION OF ROOFS FOR THE PREVENTION OF HEAT LOSS AND CONDENSATION."

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